FIG. 1

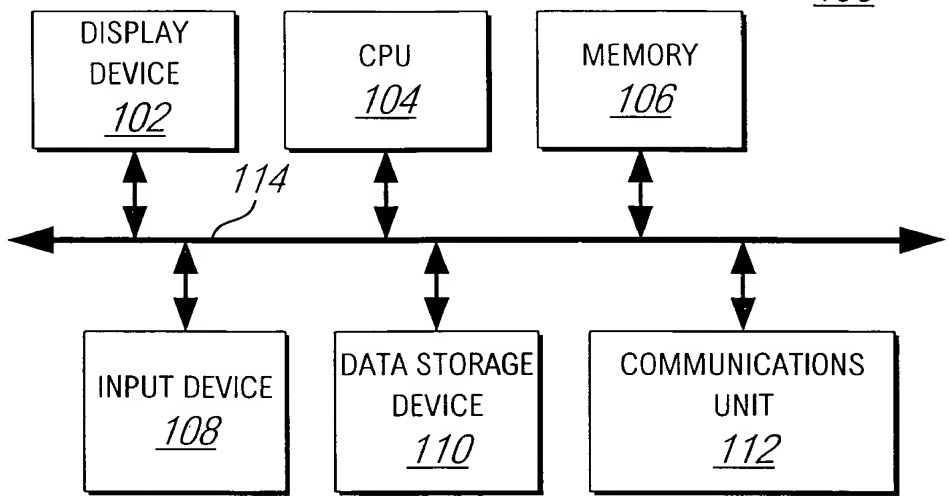


FIG. 2

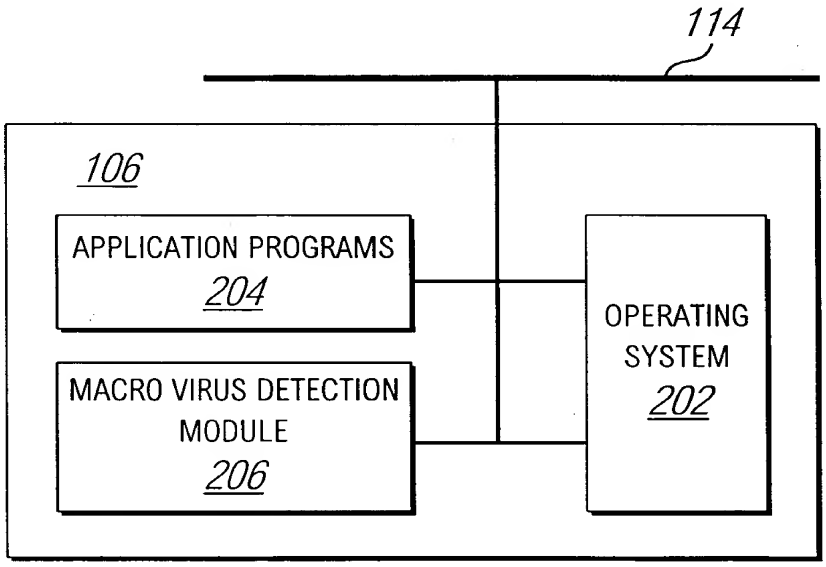
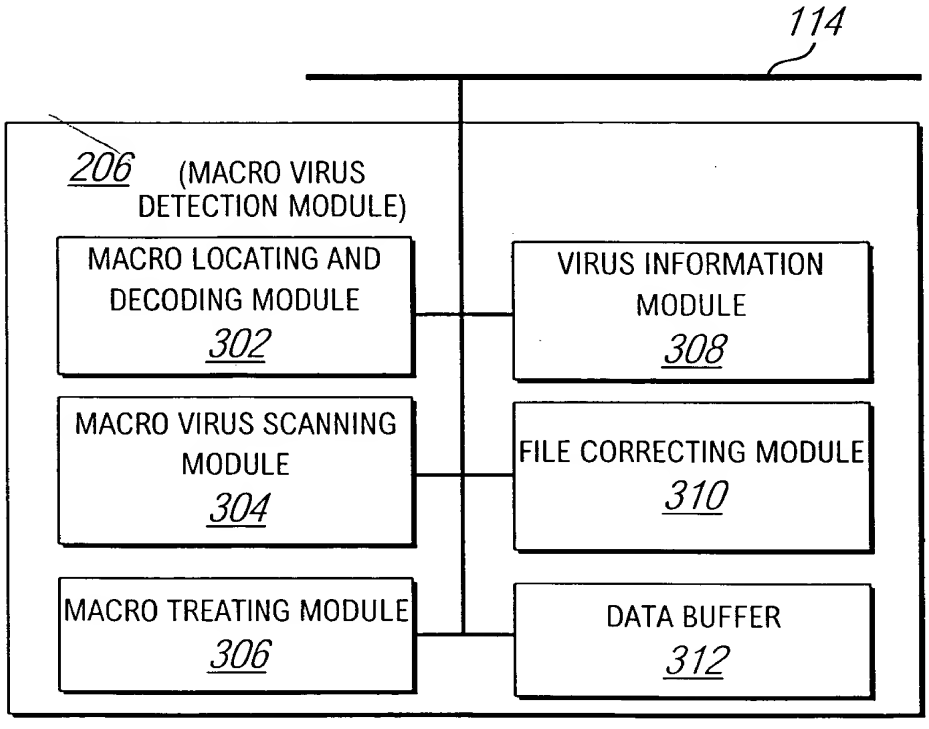


FIG. 3



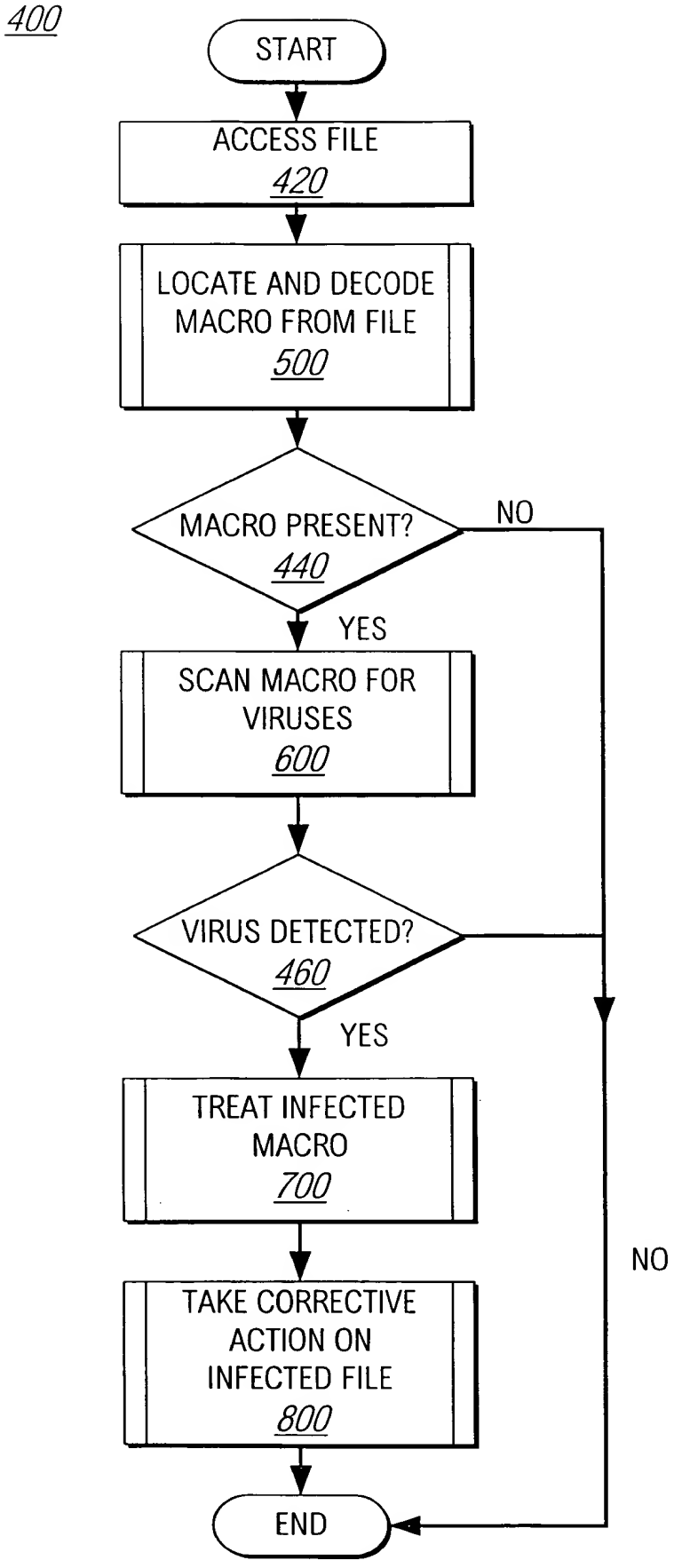

400
START
ACCESS FILE
420
LOCATE AND DECODE MACRO FROM FILE
500
MACRO PRESENT?
440
NO
YES
SCAN MACRO FOR VIRUSES
600
VIRUS DETECTED?
460
YES
NO
TREAT INFECTED MACRO
700
TAKE CORRECTIVE ACTION ON INFECTED FILE
800
END

FIG. 4

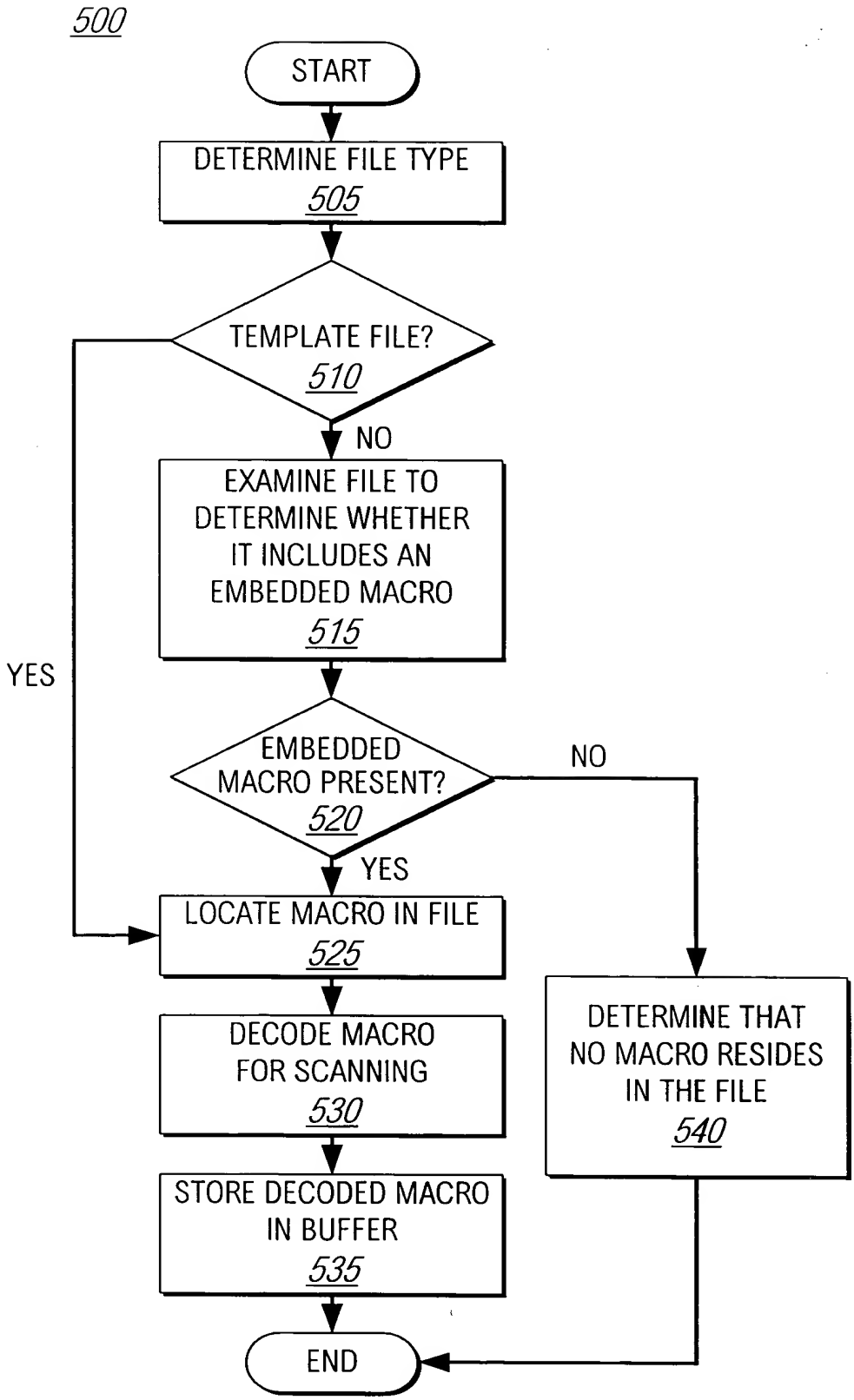

500
START
DETERMINE FILE TYPE
505
TEMPLATE FILE?
510
NO
YES
EXAMINE FILE TO DETERMINE WHETHER IT INCLUDES AN EMBEDDED MACRO
515
EMBEDDED MACRO PRESENT?
520
NO
YES
LOCATE MACRO IN FILE
525
DECODE MACRO FOR SCANNING
530
STORE DECODED MACRO IN BUFFER
535
DETERMINE THAT NO MACRO RESIDES IN THE FILE
540
END

FIG. 5

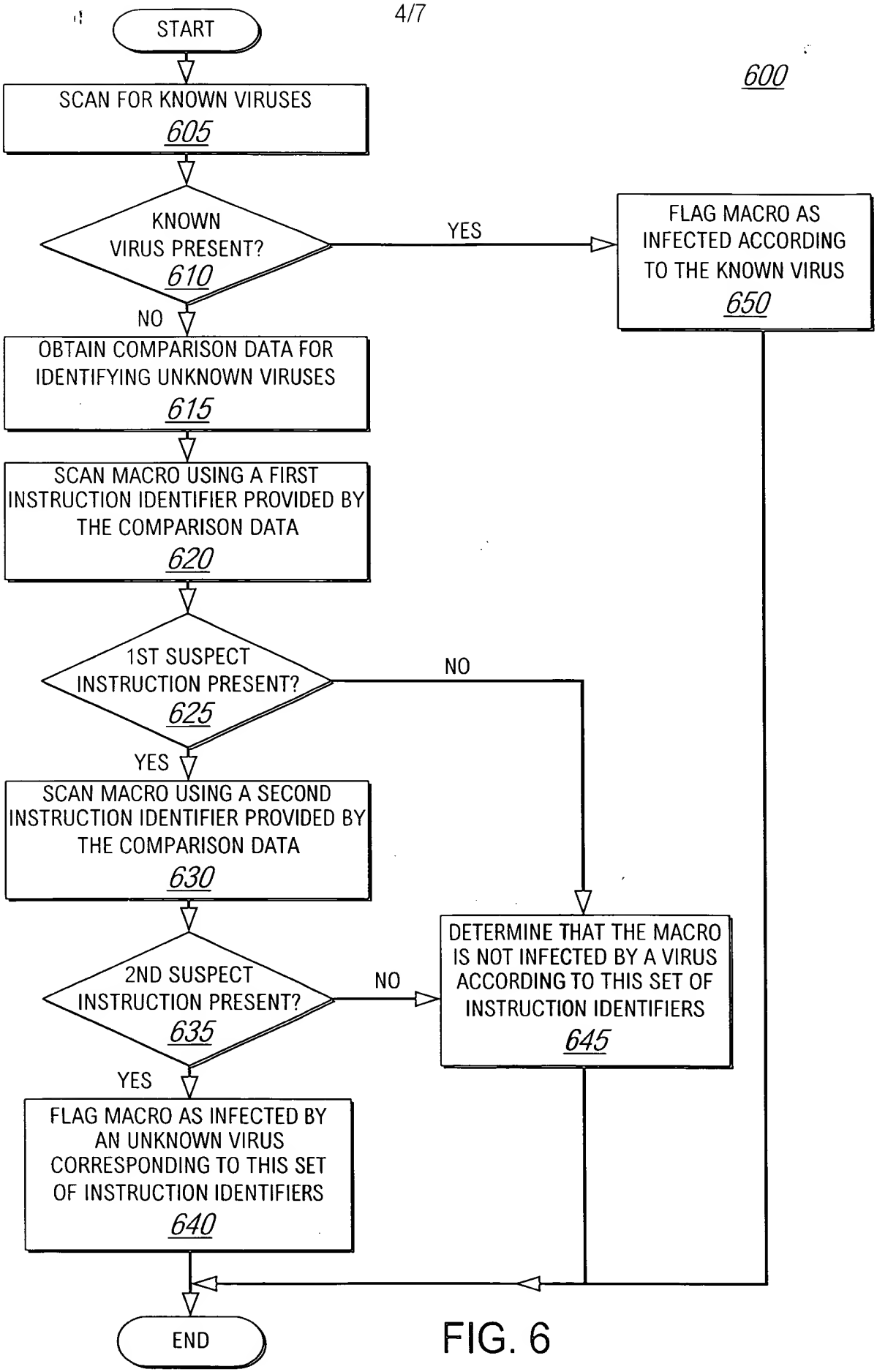

600
START
SCAN FOR KNOWN VIRUSES
605
KNOWN VIRUS PRESENT?
610
YES
FLAG MACRO AS INFECTED ACCORDING TO THE KNOWN VIRUS
650
NO
OBTAIN COMPARISON DATA FOR IDENTIFYING UNKNOWN VIRUSES
615
SCAN MACRO USING A FIRST INSTRUCTION IDENTIFIER PROVIDED BY THE COMPARISON DATA
620
1ST SUSPECT INSTRUCTION PRESENT?
625
NO
YES
SCAN MACRO USING A SECOND INSTRUCTION IDENTIFIER PROVIDED BY THE COMPARISON DATA
630
2ND SUSPECT INSTRUCTION PRESENT?
635
NO
DETERMINE THAT THE MACRO IS NOT INFECTED BY A VIRUS ACCORDING TO THIS SET OF INSTRUCTION IDENTIFIERS
645
YES
FLAG MACRO AS INFECTED BY AN UNKNOWN VIRUS CORRESPONDING TO THIS SET OF INSTRUCTION IDENTIFIERS
640
END

FIG. 6

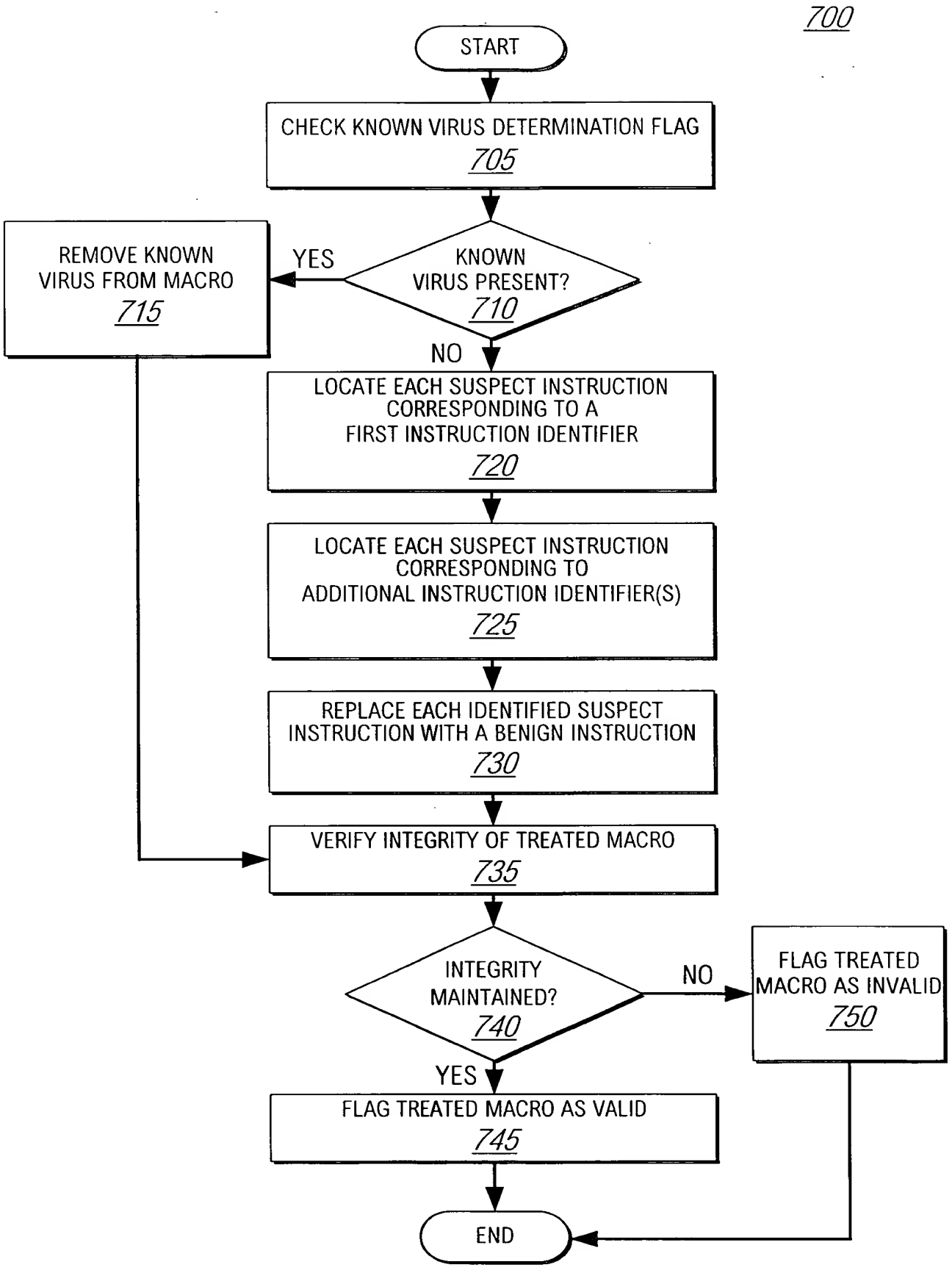

700
START
CHECK KNOWN VIRUS DETERMINATION FLAG
705
KNOWN VIRUS PRESENT?
710
YES
REMOVE KNOWN VIRUS FROM MACRO
715
NO
LOCATE EACH SUSPECT INSTRUCTION CORRESPONDING TO A FIRST INSTRUCTION IDENTIFIER
720
LOCATE EACH SUSPECT INSTRUCTION CORRESPONDING TO ADDITIONAL INSTRUCTION IDENTIFIER(S)
725
REPLACE EACH IDENTIFIED SUSPECT INSTRUCTION WITH A BENIGN INSTRUCTION
730
VERIFY INTEGRITY OF TREATED MACRO
735
INTEGRITY MAINTAINED?
740
NO
FLAG TREATED MACRO AS INVALID
750
YES
FLAG TREATED MACRO AS VALID
745
END

FIG. 7

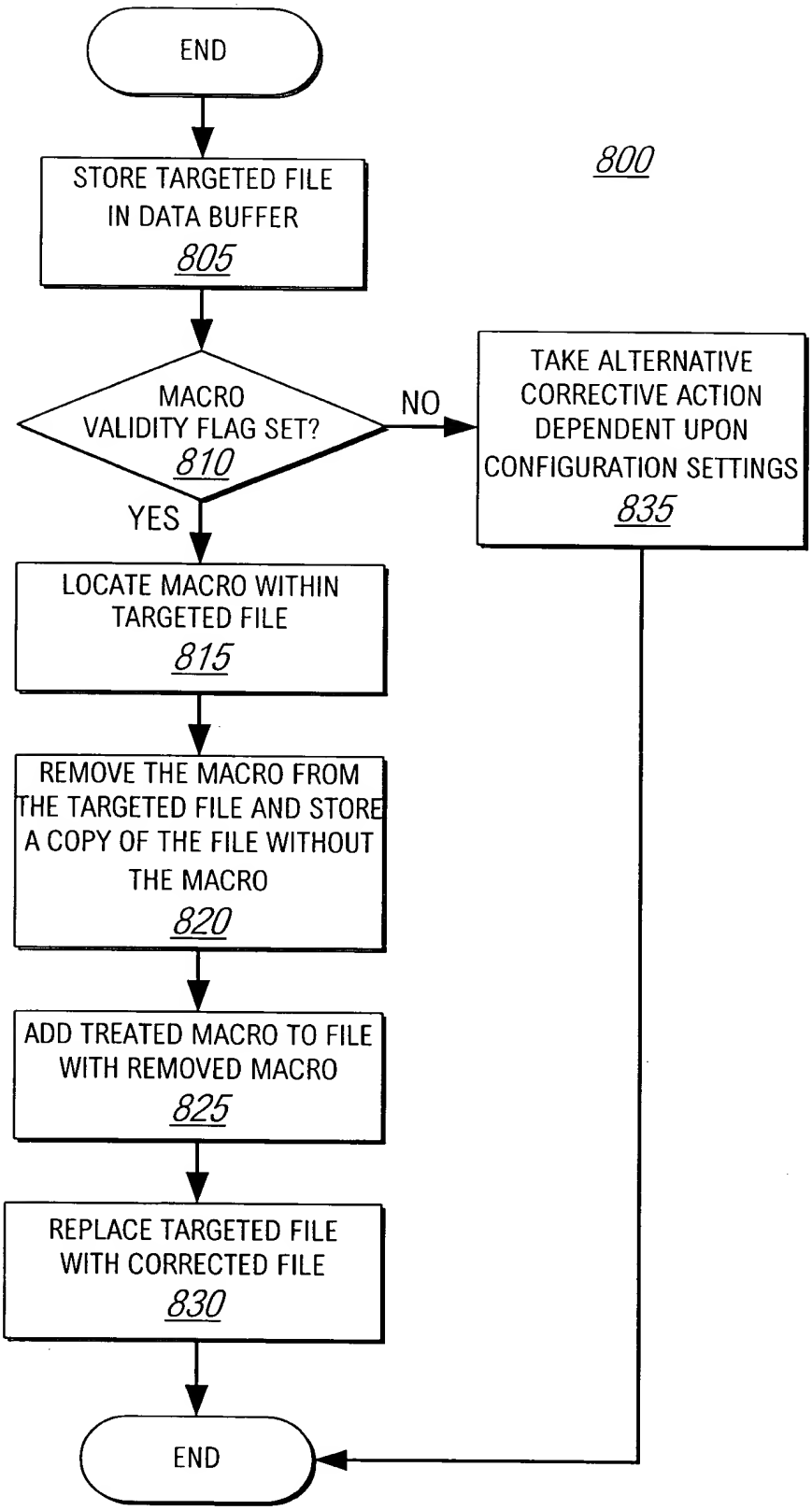

END
STORE TARGETED FILE IN DATA BUFFER
805
800
MACRO VALIDITY FLAG SET?
810
NO
TAKE ALTERNATIVE CORRECTIVE ACTION DEPENDENT UPON CONFIGURATION SETTINGS
835
YES
LOCATE MACRO WITHIN TARGETED FILE
815
REMOVE THE MACRO FROM THE TARGETED FILE AND STORE A COPY OF THE FILE WITHOUT THE MACRO
820
ADD TREATED MACRO TO FILE WITH REMOVED MACRO
825
REPLACE TARGETED FILE WITH CORRECTED FILE
830
END

FIG. 8

900

SET # (903)	INSTRUCTION ID# (904)	INSTRUCTION IDENTIFIER (TEXT/HEX) (905)
902 → 1	1	.Format = 1 73 CB 00 0C 6C 01 00
	2	Macro Copy 67 C2 80
902 → 2	1	.Format = 1 73 CB 00 0C 6C 01 00
	2	Organizer .Copy 64 6F 02 67 DE 00 73 87 02 12 73 7F
3	1	.Format = 1 73 CB 00 0C 6C 01 00
	2	macros. 6D 61 63 72 6F 73 76 08
4	1	FileSaveAs a$,1 12 6C 01 00
	2	MacroCopy 64 67 C2 80 6A 0F 47
5	1	ylformat c: /u" 79 7C 66 6F 72 6D 61 74 20 63 6A
	2	Environ$ ("COMSPEC") 80 05 6A 07 043 4F 4D
. . .	. . .	. . .
902 → *i*	1	...
	2	...
	...	...
	j	...

FIG. 9